

REMARKS/ARGUMENTS

Claims 1-7, 15, 30, 32, 34, 37-40, 42-43 and 46-47 are active in this application.

Claim 13 has been cancelled by this amendment and its limitations inserted into claim 1. No new matter has been added by this amendment.

The present invention relates to a conductive carbonaceous-fiber fabric. The fabric has a thickness of from 0.05 to 1 mm, a weight per a unit area of from 60 to 250 g/m², a bending resistance (L) as determined by the 45° Cantilever method of 6 cm or higher, and an in-plane volume resistivity of 0.2 Ω cm or lower. Further, the fabric comprises a binder or a product of carbonization of the binder in an amount of from 10 to 40% by weight and comprises carbonaceous fibers bonded to one another with the binder or its carbonization product through point contact.

The binder or its carbonization product is required to be present discontinuously as particles on the surface of the fibers. The carbonaceous fibers are obtained by spraying or applying a **dispersion of fine particles** of a semicured thermosetting resin, optionally conducting drying, pressing or both drying and pressing, and then completely curing the resin. The conductive carbonaceous-fiber fabric is obtained by weaving the yarns of carbonaceous fibers. Applicants have found that by applying the semicured thermosetting resin as discontinuous particles on the surface of the carbonaceous fibers, it is possible to provide better control of the increase in electrical resistance of the fibers and thus the fabric.

The claims stand rejected under 35 U.S.C. 102(b) or 35 U.S.C. 103 over Lisowsky, either alone or in combination with Winckler. Further, the claims stand rejected under 35 U.S.C. 102(b) or 35 U.S.C. 103 over Fiala, either alone or in combination with Winckler. However, none of these references teach the fabric of the present invention, as none of the references provide any disclosure about providing carbonaceous fibers having discontinuous

particles of a semicured thermosetting resin on the surface of the fibers, by spraying or applying a dispersion of fine particles on the fibers.

Lisowsky discloses a carbon fiber fabric which requires that the carbon-fiber fabric be optionally coated with a carbon-containing polymeric material. Column 4, lines 30 et seq state:

“The carbon-fiber fabric may be coated either by coating the yarn strands which form the carbon-fiber fabric before or while the fabric is formed or by coating the carbon-fiber fabric itself. When the fabric itself is coated, only one surface of the carbon-fiber fabric needs to be coated, and it may be advantageous to have only the bottom surface coated. Whichever way the carbon-fiber fabric is coated, the **coating may be performed by, e.g., spraying or immersing the yarn strands or the carbon-fiber fabric into a solution of the carbon-containing polymeric material.**” (emphasis added)

Thus, the fabric and fibers of Lisowsky have a coating of the polymeric material on them, NOT discontinuous particles as required in the present invention. Even though Lisowsky does teach spraying the fiber or fabric with the polymeric material, it is noted that Lisowsky teaches that it is a solution of the polymeric material in an organic diluent, and it is a coating that is formed, not discrete discontinuous particles as required in the present invention. Accordingly, Lisowsky cannot anticipate the present invention, as there is no teaching or suggestion to form discontinuous particles of a semicured thermosetting resin on the surface of the fibers, nor is there a teaching or suggestion of how one would do such a thing.

The present inventors have found that by using discontinuous particles on the surface of the yarn, instead of a coating on the surface, one obtains better control of electrical resistance, as coatings are found to cause excessive increases in the electrical resistance.

Winckler cannot overcome this deficiency of Lisowsky. Winckler nowhere discloses the application of a dispersion of fine particles to provide discontinuous particles on the surface of carbonaceous fibers. In fact, Winckler, like Lisowsky, is teaching the use of a

coating, or “film” of a binder resin on the surface of the strands or bundles of the product. (see column 3, lines 60-65). Accordingly, even when combined, the references cannot render the present invention obvious as there would be no motivation provided by Winckler to modify Lisowsky to provide the discontinuous particles present on the surface of the carbonaceous fibers as required in the present invention. As such, the rejection should be withdrawn.

Fiala also describes a construction having a coating on the fibers rather than discontinuous particles. In particular, at column 3, lines 13 et seq, Fiala teaches the impregnation of a carbon preform or fabric. The impregnation is done by known methods such as spraying, rolling, hot melt, dipping and calendaring, etc. Even though Fiala teaches spraying, it is clear from the other methods being used that the intent is to fully impregnate the carbon preform and thus render its surface and the surface of the fibers therein fully covered with the carbonaceous material. There is absolutely no teaching or suggestion to apply a dispersion of fine particles in order to result in discontinuous particles on the surface of the fibers, as required in the present invention. The coating formed by Fiala is not the same as and does not suggest the discontinuous particles of the present invention. As such, Fiala cannot anticipate the present invention.

As noted above with respect to Lisowsky, Winckler cannot overcome the deficiency of Fiala since Winckler also teaches the formation of a coating or “film” of the polymeric material, NOT the formation of discontinuous particles of the polymer on the surface of the fibers. As such, when combined, Fiala and Winckler cannot render the present invention obvious since there is no suggestion or teaching to provide the product as claimed having discontinuous particles of a semicured thermosetting resin on the surface of the fibers making up the fabric. Accordingly, the rejection should be withdrawn.

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Reply to Office Action of November 2, 2006

Applicants submit that the application is now in condition for allowance and early notification of such action is earnestly solicited.

Respectfully submitted,

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A handwritten signature in dark ink, appearing to read "J. Derek Mason", is written over a horizontal line.

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